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BOYER, RANDY	

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRUCE E. KREISCHER

Appeal 2008-4305
Application 10/792,108
Technology Center 1700

Decided: September 24, 2008

Before ADRIENE LEPIANE HANLON, TERRY J. OWENS, and THOMAS A. WALTZ, *Administrative Patent Judges*.

HANLON, *Administrative Patent Judge*.

DECISION ON APPEAL

A. STATEMENT OF THE CASE

This is an appeal under 35 U.S.C. § 134 from an Examiner's final rejection of claims 1-16, 20-26, and 28-34, all of the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b). We REVERSE.

The Examiner finally rejected claims 1-8, 14-16, 20-26, and 28-34 under 35 U.S.C. § 103(a) as unpatentable over the combination of Dixon[1] and Seader.[2] Final 3-8.[3]

The Examiner finally rejected claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over the combination of Woodard[4] and Seader. Final 8-11.

B. ISSUES

Whether the Appellant has shown that the Examiner reversibly erred in rejecting claims 1-8, 14-16, 20-26, and 28-34 under 35 U.S.C. § 103(a) as unpatentable over the combination of Dixon and Seader.

Whether the Appellant has shown that the Examiner reversibly erred in rejecting claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over the combination of Woodard and Seader.

C. CLAIMED SUBJECT MATTER

Claim 28 is representative of the subject matter on appeal, and it reads as follows:

> A system for separating an oligomerization reactor effluent comprising:
> (a) a vapor/liquid separator to flash the oligomerization reactor effluent into a vapor portion and a liquid portion; and
> (b) a distillation column in fluid communication with the vapor/liquid separator, wherein the distillation column has a side draw for withdrawing an oligomerization product stream

[1] WO 03/053890 A1 published July 3, 2003 ("Dixon").
[2] Perry's Chemical Engineers' Handbook, 13:1, 4-9 (7th ed. 1997) ("Seader").
[3] Final Office Action mailed June 29, 2007.
[4] WO 99/19280 published April 22, 1999 ("Woodard").

and receives as separate feeds the vapor portion and the liquid portion from the vapor/liquid separator.

App. Br. 19,[5] Claims Appendix.

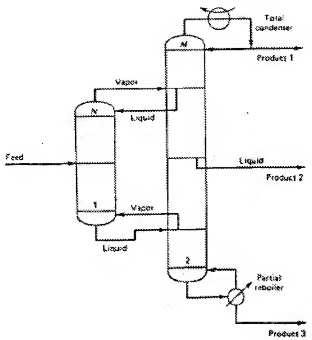
D. ANALYSIS

The Examiner found that Dixon and Woodard each disclose a method for separating an oligomerization reactor effluent. Ans. 4, 9-10.[6] The Examiner found that neither Dixon nor Woodard disclose that liquid and vapor portions of the oligomerization reactor effluent are fed to the same distillation column and that the oligomerization product is withdrawn from a side drawn outlet. Ans. 4-5, 10.

The Examiner found that Seader discloses a thermally coupled separation system for separating a ternary stream in which a first separator is used to separate a majority of light components into the vapor phase and heavy components into the liquid phase. The Examiner found that Seader discloses that the vapor and liquid product streams are then directed to a second separator, i.e., a distillation column, wherein three products are produced, with the intermediate boiling species being withdrawn as a side stream. Ans. 5, 10.

The thermally coupled separation system referred to by the Examiner is illustrated in Seader Figure 13-6(b) and is identified as "Petlyuk towers." Figure 13-6(b) is reproduced below:

[5] Appeal Brief dated November 26, 2007.
[6] Examiner' Answer mailed December 26, 2007.



Seader Figure 13-6(b) depicts Petlyuk towers.

The Examiner also found that Seader discloses the use of a single-stage flash, e.g., for use as a first separator in a separation system, where the relative volatility between two components to be separated is relatively large or where only a partial separation is to be made. Ans. 5-6, 11; Seader Figure 13-7(a).

The Examiner found:

> [T]he processes of Dixon or Woodard can be modified to ***either (1)*** perform the claimed separation by using the setup of Seader's Fig. 13-6(b) as it is shown in that figure with the first column (which Seader refers to as a "prefractionator") serving as a means for "flashing the oligomerization reactor effluent into a liquid portion and a vapor portion" (first combinatory use of Seader); ***or (2)*** perform the claimed separation by replacing the first column (i.e. "prefractionator") of Seader's Fig. 13-6(b) with the flash drum of Seader's Fig. 13-7(a) and whereby the flash drum would deliver separate vapor and liquid input

> streams to the second column of Seader's Fig. 13-6(b) (second combinatory use of Seader).

Ans. 13 (emphasis in original).

First, the Appellant argues that the Petlyuk towers' prefractionation taught by Seader is not the same as flashing recited in the claims on appeal. Reply Br. 6.[7] The Appellant explains:

> [T]here are numerous differences between flashing and Petlyuk Towers' prefractionation. First, flashing is a **single-stage** process. In contrast, the Petlyuk Towers' prefractionator is a multistage process[1]. Thus, *Seader's* disclosure of multi-stage prefractionation cannot be a means for single-stage flashing. Second, flashing as a single-stage process does not need a condenser and reboiler or any means that function as a condenser and reboiler. In contrast, the Petlyuk Towers' prefractionator is a distillation column wherein the condenser and reboiler function is accomplished by returning a liquid stream and a vapor stream, respectively, from the Petlyuk Towers' second distillation column (the fractionator) to the Petlyuk Towers' prefractionator.
>
> [1] *Seader's* Fig. 13-6(b) indicates that the prefractionator has N stages. N is understood to be at least two.

Reply Br. 6 (emphasis in original).

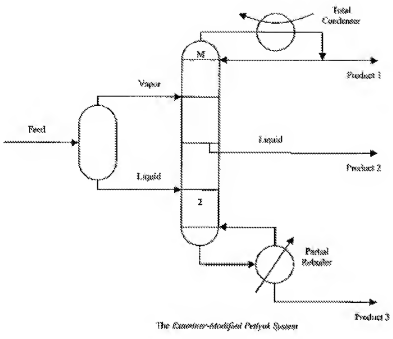
Based on the record before us, we find the Appellant's explanation outlining the differences between Petlyuk towers' prefractionation and flashing to be reasonable. The Examiner has failed to present any evidence or argument in response to the Appellant's explanation. Thus, we find that the prefractionator disclosed in Seader Figure 13-6(b) does not operate as a separator that *flashes* an oligomerization reactor effluent into a vapor portion and a liquid portion.

[7] Reply Brief dated February 26, 2008.

As for substituting a flash drum for the prefractionator disclosed in Seader Figure 13-6(b), the Appellant argues that the Examiner's modification changes the principle of operation of the Petlyuk towers. App. Br. 10-11.

The Petlyuk towers illustrated in Seader Figure 13-6(b) are described as a thermally coupled system. Seader 13-5:2. The Appellant argues that the prefractionator and column of the Petlyuk towers are thermally coupled in that the reflux and boil-up for the prefractionator are provided by the distillation column. App. Br. 10. The Appellant argues that the "Examiner-Modified Petlyuk System" eliminates the prefractionator reflux and boil-up streams, and thus, eliminates the thermal coupling in the Petlyuk towers and changes their principle of operation. App. Br. 11.

The Appellant provides an illustration of the "Examiner-Modified Petlyuk System" on page 9 of the Appeal Brief. That illustration is reproduced below:



Appellant's illustration depicting the "Examiner-Modified Petlyuk System."

In response, the Examiner submits that elimination of the Petlyuk towers' prefractionator illustrated in Seader Figure 13-6(b) would not destroy the operability of the Petlyuk towers. According to the Examiner:

> [W]hile Seader (in Fig. 13-6(b)) discloses reflux of liquid and vapor from the main column back to the prefractionator (i.e. first column), he does not specify any minimum reflux ratio. Thus, Examiner finds that replacement of the prefractionator of Seader's Fig. 13-6(b) with the flash drum of Seader's Fig. 13-7(a) (and having no reflux back to the flash drum) would not operate any differently than the setup as shown in Fig. 13-6(b) having a very small reflux ratio (i.e. the ratio of the amount of condensate or vapor being returned to the amount being withdrawn).

Ans. 15.

The Examiner has failed to direct us to any evidence that supports these findings, namely, that the Petlyuk towers would operate as intended

with no reflux as in the "Examiner-Modified Petlyuk System." *See* Reply Br. 11-12.

Based on the record before us, we find that replacing the Petlyuk tower's prefractionator with a flash drum renders the Petlyuk towers inoperable as a thermally coupled system and changes their principle of operation. *See In re Ratti*, 270 F.2d 810, 813 (CCPA 1959) (suggested combination of references would require a substantial reconstruction and redesign of the prior art as well as a change in the basic principles under which the prior art was designed to operate). Thus, we find that one of ordinary skill in the art would not have been motivated to replace the Petlyuk towers' prefractionator with a flash drum as proposed by the Examiner.

For the reasons set forth above, the Appellant has shown that the Examiner reversibly erred in rejecting claims 1-8, 14-16, 20-26, and 28-34 under 35 U.S.C. § 103(a) as unpatentable over the combination of Dixon and Seader. Likewise, the Appellant has shown that the Examiner reversibly erred in rejecting claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over the combination of Woodard and Seader.

E. DECISION

The rejection of claims 1-8, 14-16, 20-26, and 28-34 under 35 U.S.C. § 103(a) as unpatentable over the combination of Dixon and Seader is reversed.

The rejection of claims 1-13 under 35 U.S.C. § 103(a) as unpatentable over the combination of Woodard and Seader is reversed.

REVERSED

ack

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